

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
28 October 2004 (28.10.2004)

PCT

(10) International Publication Number
WO 2004/091975 A1

(51) International Patent Classification⁷: B60R 1/074

(21) International Application Number:
PCT/NL2004/000256

(22) International Filing Date: 15 April 2004 (15.04.2004)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:
1023228 18 April 2003 (18.04.2003) NL

(71) Applicant (for all designated States except US): IKU HOLDING MONTFOORT B.V. [NL/NL]; Waardsedijk Oost 9, NL-3417 XJ Montfoort (NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): BROUWER, Stefan, Frits [NL/NL]; Hollanderstraat 22, NL-2517 HK Den Haag (NL). VAN GELDEREN, Arjen [NL/NL];

Prins Bernardstraat 8, NL-3405 XV Benschop (NL). VAN STIPHOUT, Paulus, Gerardus, Maria [NL/NL]; Frans Kalkaweg 25, NL-3446 ZK Woerden (NL).

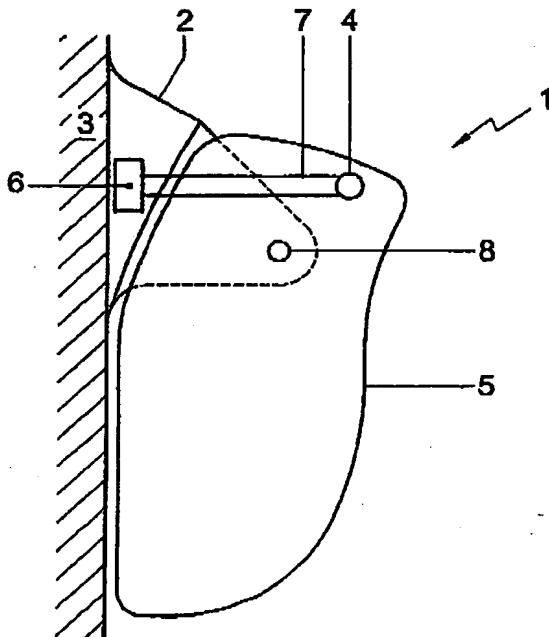
(74) Agent: WINCKELS, J., H., F.; Nieuwe Parklaan 97, NL-2587 BN Den Haag (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: WING MIRROR UNIT



(57) Abstract: A wing mirror unit (1), in particular for a motor vehicle, comprising a base plate (2), on which by means of a pivot construction a supporting frame (5) is provided. The wing mirror (1) further comprises an electric actuator, with which the supporting frame (5) is pivotal with respect to the base plate (2) between a folded orientation, in which the supporting frame (5) substantially abuts along the body of the motor vehicle (3), and an unfolded orientation, in which the supporting frame (5) is substantially oriented transversely to the body (3). Furthermore, the electric actuator is provided with an engaging part coupled with the supporting frame (5), which engaging part is adjustable with respect to the base part (2) substantially transversely to the body (3) between a first orientation located near the base plate (2) and a second orientation located farther outward with respect to the body (3).

80/553553

RECEIVED 14 OCT 2005

INTERNATIONAL APPLICATION AS FILED

Title: Wing mirror unit

The invention relates to a wing mirror unit, in particular for a motor vehicle, comprising a base plate, on which by means of a pivot construction a supporting frame is provided, further comprising an electric actuator, with which the supporting frame is pivotal with respect to the base plate between a folded orientation, in which the supporting frame substantially abuts along the body of the motor vehicle, and an unfolded orientation, in which the supporting frame is substantially oriented transversely to the body.

Such a wing mirror unit is, for instance, known from NL 1 019 258, in which a pivot construction is described for pivotally coupling the supporting frame to the base plate in a manner poor in vibrations. In the folded orientation, the supporting frame abuts substantially along the body of the motor vehicle, so as to reduce the total width of the motor vehicle. This orientation provides more maneuvering space, for instance during parking. In the unfolded orientation, the supporting frame abuts substantially in the transverse direction, so that the wing mirror unit is ready for normal use by a driver of the motor vehicle.

It is desirable to adjust the wing mirror unit in the unfolded orientation such that the air resistance and the noise production of air flowing along the unit remains minimal, while the mirror glass of the wing mirror unit yet gives a good view. In the folded orientation, the aim is directed to a position of the wing mirror unit in which the total width of the motor vehicle is minimized. In practice, the above requirements are not very compatible, so that in the design a position is chosen that form a compromise between the conflicting requirements. Consequently, in the folded and/or unfolded orientation, the wing mirror unit is not in an optimal position.

The invention has for its object to provide a wing mirror unit of the type mentioned in the opening paragraph, in which, while retaining the advantages, the above drawbacks are avoided. To this end, the electric actuator of the wing mirror unit according to the invention is provided with 5 an engaging part coupled with the supporting frame, which engaging part is adjustable with respect to the base part substantially transversely to the body between a first orientation located near the base plate and a second orientation located farther outward with respect to the body.

By adjusting the supporting frame transversely to the body, an extra 10 degree of movement is obtained in the design of the pivot construction, so that the position of the supporting frame can be optimized in the two above orientations, namely in the folded orientation with respect to the maximum width of the motor vehicle, and in the unfolded orientation with respect to the noise reduction and minimization of the air resistance.

15 In an advantageous embodiment according to the invention, the pivot construction of the wing mirror unit comprises a main pivot. In an emergency situation, such as, for instance, when coming into contact with an object, the supporting frame can pivot around the main pivot toward or into the folded orientation, for instance to an emergency folded orientation 20 located between the unfolded orientation and the folded orientation. This reduces the risk of injury and material damage in case of collisions. After pivoting to the emergency folded orientation, the wing mirror unit can pivot back again around the main pivot to the unfolded orientation, so that the original position is obtained again.

25 By adjusting the main pivot transversely to the body between a first orientation located near the base plate and a second orientation located farther outward with respect to the body, it is ensured that the wing mirror unit can be pivoted practically completely flat against the body, so that a minimum width of the vehicle in the parking position is obtained, while 30 simultaneously satisfying legal restrictions prevailing in many countries,

which, in the unfolded orientation of the wing mirror unit, only admit a limited distance between the base plate and the main pivot. This is in contrast with many known wing mirror units which satisfy the above legal restrictions, and which have a main pivot at a fixed distance with respect to the base plate. In such wing mirror units, it is problematic because of the conflicting limiting conditions to pivot the wing mirror unit into an orientation in which the wing mirror unit abuts completely flat against the body.

Preferably, the engaging part supports the main pivot, so that a pivot element for coupling the engaging part of the actuator to the supporting frame is advantageously integrated with the main pivot.

Preferably, in the folded orientation of the wing mirror unit, the end is in the second orientation located farther outward, so that the supporting frame can pivot farther to the body, thereby reducing the total width of the motor vehicle, although the supporting frame is precisely within the orientation located outward. Advantageously, in the unfolded orientation of the wing mirror unit, the end is further in the folded orientation located near the base plate, so that slits that may be present through the more inward position are diminished and the air resistance is reduced.

Further advantageous embodiments of the invention are defined in the subclaims.

The invention will be explained in more detail on the basis of exemplary embodiments, which are shown in the drawing. In the drawing:

Fig. 1 shows a diagrammatic top view of a wing mirror unit according to the invention in the folded orientation;

Fig. 2 shows a diagrammatic top view of the wing mirror unit of Fig. 1 in the unfolded orientation; and

Fig. 3 shows a diagrammatic detailed view of another wing mirror unit according to the invention.

The figures are only diagrammatic representations of preferred embodiments of the invention. In the figures, similar or corresponding parts are denoted by the same reference numerals.

In Fig. 1, a wing mirror unit 1 is shown, which comprises a base plate 2 for attachment to the body 3 of a motor vehicle. Provided on the base plate 2 is a main pivot 4, which forms part of a pivot construction. With the aid of the main pivot 4, a supporting frame 5 is pivotally attached to the base plate 2. In case of emergency operation, the supporting frame 5 can pivot over the main pivot 4 both forward and backward, so as to limit injury and material damage in case of collisions.

Further attached to the base plate 2 is an actuator, which comprises an actuator housing 6 with a driving arm designed as spindle 7, for pivoting the supporting frame 5 with respect to the base plate 2 around an auxiliary pivot 8 from a folded orientation to an unfolded orientation, and conversely. Located at the end of the spindle 7 is an engaging part, which is attached to the main pivot 4. Fig. 1 shows the wing mirror unit 1 in the folded orientation, in which the supporting frame 5 abuts substantially flat against the body 3 of the motor vehicle, so that the motor vehicle as less as possible projects from the body. In the unfolded orientation, as shown in Fig. 2, the supporting frame 5 is oriented substantially transversely to the longitudinal direction of the body 3, so that, via the wing mirror unit 1, a driver of the motor vehicle can form an image of the view behind the vehicle without turning his head backward.

During pivoting of the wing mirror unit by controlling the electric actuator, the spindle 7 adjusts, in an adjusting direction, substantially transversely to the body 3 from a first orientation located near the base plate 2 to a second orientation located farther outward with respect to the body 3, so that the main pivot 4, too, adjusts in the adjusting direction, and a translation of the main pivot 4 is obtained. When within the context of the application reference is made to adjusting transversely to the body, this is

understood to mean that the adjusting direction comprises a component in the direction transverse to the body 3. The adjusting direction may also comprise components in other directions, such as, for instance, in a direction substantially parallel to the body 3 and directed backward. In Figs. 1 and 2, 5 the adjusting direction is practically transverse to the body 3. In another embodiment, the adjusting direction is, for instance, directed diagonally backward.

During pivoting of the wing mirror unit 1 from the folded orientation to the unfolded orientation, the main pivot 4 adjusts from the second 10 orientation to the first orientation located near the base plate 2, so that the wing mirror unit assumes a favorable aerodynamic form. When pivoting to the folded orientation, the main pivot 4 adjusts by controlling the actuator just outward, so that the supporting frame 5 abuts close to the body 3 and only assumes a limited space.

15 Since for the position of the main pivot 4 in unfolded orientation of the wing mirror unit 1, because of prevailing standards, only a limited offset with respect to the body 3 is allowed, the optimization of the position of the supporting frame 5 with respect to the base plate 2 is limited, in particular in case the wing mirror unit 1 has significant dimensions in the direction 20 transverse to the mirror glass provided on the wing mirror unit. However, by adjusting, as described above, the main pivot 4 during pivoting substantially in transverse direction, more freedom of design is created for the optimization of positions, while yet the prevailing standards are satisfied.

25 The auxiliary pivot 8 in Figs. 1 and 2 comprises on the supporting frame 5 two journals being under spring action, which are received in a recess of the base plate 2. The additional auxiliary pivot 8 may, however, also be designed differently, for instance by forming a projection on the base plate 2 and receiving it in a suitably provided recess of the supporting frame 30 5. Preferably, projection and recess are beveled, so that decoupling from the

auxiliary pivot 8 takes place with a well-defined force and with little risk of damage. In emergency situations, by decoupling, the wing mirror unit 1 can pivot forward or backward without forcing the actuator housing 6.

5 Subsequently, the auxiliary pivot 8 can be restored by pivoting the wing mirror unit 1 so far back that the journals are again received in the recess under spring action.

By controlling the actuator, as shown in Figs. 1 and 2, the spindle 7 substantially makes a linear movement, namely in the adjusting direction. Since during adjustment of the spindle 7 the main pivot 4 pivots around the 10 auxiliary pivot 8, the end of the spindle 7 adjustable in transverse direction describes no pure translation, but a segment of an arc of a circle, such as the driving rod of a driven wheel. By arranging the spindle 7 with some play with respect to the actuator housing 6, the end thereof can pivot out at the location of the dead center by some degrees with respect to the linear 15 movement, so that the spindle yet remains simple in construction.

In another embodiment, the spindle 7 is attached to the actuator housing 6 so as to be free from play. By receiving the projection of the auxiliary pivot 8 in a trough-shaped recess, it is possible during pivoting of the wing mirror unit 1 to shift the supporting frame 5 somewhat with 20 respect to the base plate 2 in a direction that is oriented substantially transversely to the adjusting direction of the spindle 7. In this embodiment, too, the whole construction therefore remains relatively simple.

25 Fig. 3 shows a detailed view of yet another embodiment of the wing mirror unit to be simply implemented, with the driving arm comprising a curved rack 9. In this embodiment, the end of the rack 9, to which the main pivot 4 is attached, follows the path, shown in dash lines in the figure, which the main pivot 4 describes with respect to the base plate 2.

The invention is not limited to the exemplary embodiments described herein. Many variants are possible.

Thus, in the embodiment shown, the main pivot 4 is attached to the end of the spindle 7. It is also possible, however, to have the end, as engaging part, pivotally engage the supporting frame 5 and to couple another part of the supporting frame to the main pivot 4, so that the driving 5 arm is formed, on the one hand, by the spindle 7 and, on the other hand, by the part of the supporting frame 5 between the engaging part of the spindle 7 and the part of the supporting frame that is coupled to the main pivot 4.

Furthermore, it is not necessary to design the driving arm in Figs. 1 and 2 as a spindle 7. The driving arm may also comprise other driving 10 bodies, such as, for instance, a rack.

Such variants will be apparent to those skilled in the art and are deemed to be within the scope of the invention as defined by the appended subclaims.

CLAIMS

1. A wing mirror unit, in particular for a motor vehicle, comprising a base plate, on which by means of a pivot construction a supporting frame is provided, further comprising an electric actuator, with which the supporting frame is pivotal with respect to the base plate between a folded orientation, 5 in which the supporting frame substantially abuts along the body of the motor vehicle, and an unfolded orientation, in which the supporting frame is substantially oriented transversely to the body, wherein, furthermore, the electric actuator is provided with an engaging part coupled with the supporting frame, which engaging part is adjustable with respect to the base part substantially transversely to the body between a first orientation located near the base plate and a second orientation located farther outward 10 with respect to the body.
2. A wing mirror unit according to claim 1, wherein the pivot construction comprises a main pivot for pivoting, in case of emergency 15 operation, the supporting frame from the unfolded orientation to an emergency folded orientation.
3. A wing mirror unit according to claim 2, wherein the main pivot is adjustable transversely to the body between a first orientation located near the base plate and a second orientation located farther outward with respect 20 to the body.
4. A wing mirror unit according to claim 3, wherein the engaging part supports the main pivot.
5. A wing mirror unit according to any one of the preceding claims, 25 wherein the electric actuator is arranged to adjust, during pivoting of the supporting frame from a folded orientation to an unfolded orientation, the engaging part toward the base plate, and, during pivoting of the supporting

frame from an unfolded orientation to a folded orientation, to adjust the engaging part away from the base plate.

6. A wing mirror unit according to any one of the preceding claims, wherein the electric actuator is a linear actuator with a driving arm, the

5 end of which forms the engaging part.

7. A wing mirror unit according to any one of the preceding claims, wherein the pivot construction further comprises an auxiliary pivot, which is disconnectably anchored to the base plate or the supporting frame, around which auxiliary pivot the supporting frame pivots with respect to the base 10 plate during the pivoting, by controlling the actuator, between the folded orientation and the unfolded orientation.

8. A wing mirror unit according to any one of the preceding claims, wherein the engaging part is arranged with some play with respect to the actuator housing, so that the engaging part, to overcome a dead center 15 during the adjustment, can pivot out by some degrees with respect to the adjusting direction.

9. A wing mirror unit according to any one of the preceding claims, wherein the actuator comprises a driving arm designed as a curved rack.

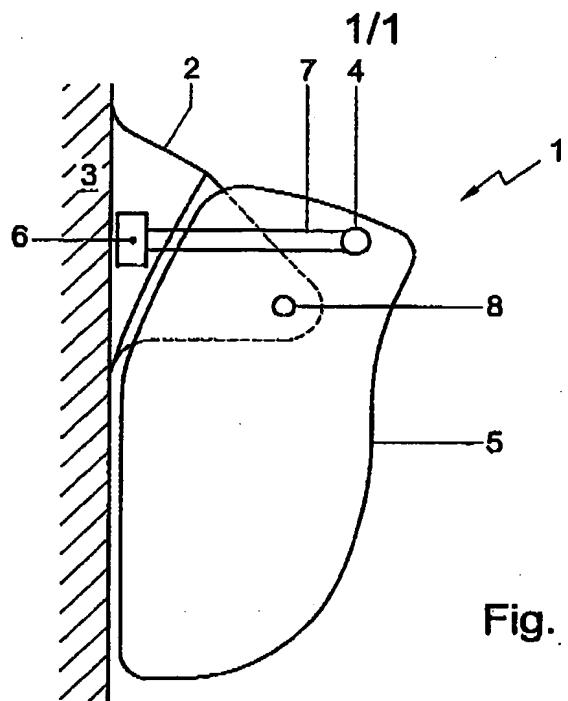


Fig. 1

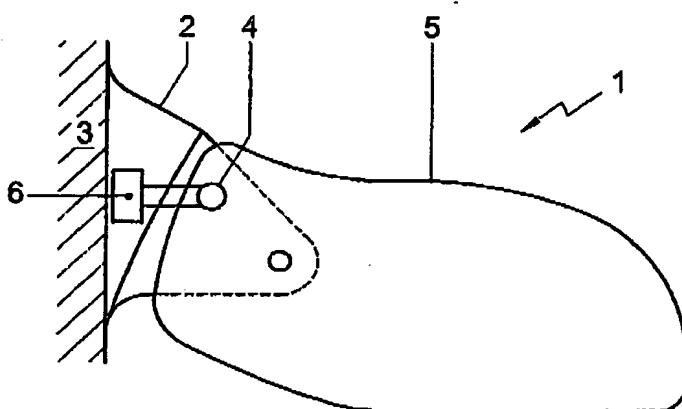


Fig. 2

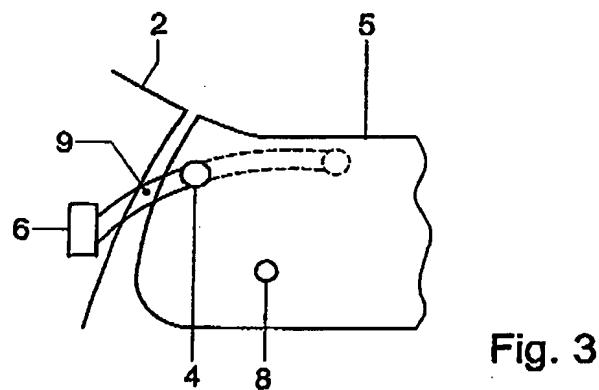


Fig. 3

INTERNATIONAL SEARCH REPORT

Final Application No

PCT/NL2004/000256

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B60R1/074

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 009, no. 261 (M-422), 18 October 1985 (1985-10-18) -& JP 60 107433 A (NIHON HATSUJIYOU KK), 12 June 1985 (1985-06-12) abstract; figures 1-6	1,5,6,8
Y	DE 35 29 215 A (STEINBORN RUDOLF) 12 February 1987 (1987-02-12) the whole document	2,3,7
X	DE 35 29 215 A (STEINBORN RUDOLF) 12 February 1987 (1987-02-12) the whole document	1,5,6,8
A	US 4 969 727 A (ECKERT DIETER ET AL) 13 November 1990 (1990-11-13) column 1, line 63 - column 2, line 58; figures 1-3	2-4,7
X	US 4 969 727 A (ECKERT DIETER ET AL) 13 November 1990 (1990-11-13) column 1, line 63 - column 2, line 58; figures 1-3	1-5,9
		-/-

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority (claims) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not to conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *Z* document member of the same patent family

Date of the actual completion of the international search

3 August 2004

Date of mailing of the international search report

12/08/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patenttaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax. (+31-70) 340-3016

Authorized officer

Burley, J

INTERNATIONAL SEARCH REPORT

PCT/NL2004/000256

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 940 230 A (CRANDALL ROBERT M) 17 August 1999 (1999-08-17) column 2, line 66 - column 5, line 3; figures 3-6	1,2,5,6, 8,9
Y	US 2001/028517 A1 (JURASCHEK PETER) 11 October 2001 (2001-10-11) the whole document	2,3,7
A	FR 2 759 044 A (MAGNETI MARELLI FRANCE) 7 August 1998 (1998-08-07) the whole document	1,5,6
A		1-9

INTERNATIONAL SEARCH REPORT

 International Application No
PCT/NL2004/000256

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
JP 60107433	A	12-06-1985	JP JP	1052213 B 1570624 C		08-11-1989 25-07-1990
DE 3529215	A	12-02-1987	DE	3529215 A1		12-02-1987
US 4969727	A	13-11-1990	DE FR GB IT JP JP	3819471 A1 2632585 A1 2220180 A ,B 1231584 B 2031959 A 2588434 B2		14-12-1989 15-12-1989 04-01-1990 18-12-1991 01-02-1990 05-03-1997
US 5940230	A	17-08-1999		NONE		
US 2001028517	A1	11-10-2001	DE AT WO DE DK EP ES JP US	19623885 A1 203723 T 9746421 A1 59704197 D1 901429 T3 0901429 A1 2162302 T3 2000514380 T 6234637 B1		11-12-1997 15-08-2001 11-12-1997 06-09-2001 08-10-2001 17-03-1999 16-12-2001 31-10-2000 22-05-2001
FR 2759044	A	07-08-1998	FR	2759044 A1		07-08-1998